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~~a second gate electrode adjacent to said second gate insulating film,
wherein said first semiconductor film contains germanium at a higher concentration than
said second semiconductor film.~~

37. (New) The semiconductor device according to claim 36 wherein said first semiconductor film is doped with germanium while the second semiconductor film is not intentionally doped with germanium.

38. (New) A semiconductor device according to claim 36 wherein said semiconductor device is selected from the group consisting of a handy phone, a video camera, a mobile computer, a head-mount display, a rear-type projector and a front-type projector.--

REMARKS

We are in receipt of the Office Action of January 4, 2001, and the above amendment and following remarks are made in light thereof.

Claims 1-29 are pending in the application, with claims 16-29 having been withdrawn from consideration pursuant to a restriction requirement. In the Office Action of January 4, 2001, claims 1-16 stand rejected under 35 USC 103 over various combinations of Yamazaki et al. 6,160,271, King et al. IEEE Transactions on Electron Devices, Zhang et al., 5,648,277, Ohtani et al. 5,643,826, and Inoue et al. 6,153,893. By the foregoing amendment, the withdrawn claims 16-29 are canceled, claims 1-3 and 13-15 amended and claims 30-38 added.

The present invention is directed to a semiconductor device such as an active matrix display device having at least two thin film transistors. In accordance with a typical example of the present invention, a pixel TFT connected to a pixel electrode has a channel region comprising silicon which is not doped with germanium while a TFT included in a driver circuit for driving the pixel TFT has a channel region comprising silicon which is doped with germanium. The TFT having a channel region comprising silicon doped with germanium is

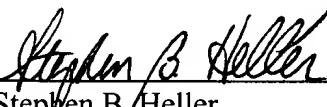
suitable for realizing a high field effect mobility. However, the applicant recognized a problem that such a TFT tends to have a higher off current due to the large carrier density. Based on the recognition of this problem, the applicants' invention resides in the use of the TFT having a channel region comprising silicon doped with germanium in a selected portion of the semiconductor device depending upon the required characteristics of the circuits. See, the specification, for example, in page 3, first and second paragraphs, and the paragraph bridging pages 3 and 4 of the specification.

In the rejections, the examiner contends that the use of the silicon germanium would have been obvious inasmuch as it is taught by King et al. However, applicant is not asserting that the use of silicon germanium is novel by itself. The patentability resides in that germanium doped silicon is used in selected TFTs of a semiconductor device while it is not used in the remaining TFTs of the same semiconductor device. The cited King article merely describes silicon germanium TFT, but it does not teach the basic concept of the present invention. Neither of Yamazaki et al., Zhang et al. nor Inoue et al. cure the deficiency of King.

In view of the above argument and the proposed Amendment as attached hereto, we believe that all the pending rejections can be overcome.

Respectfully submitted,

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:)
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Shunpei YAMAZAKI et al.)
)
Serial No.: 09/262,657)
)
Filed: March 4, 1999)
)
Examiner: Mark Prenty)
)
Art Unit: 2822)
)
For: SEMICONDUCTOR DEVICE AND)
METHOD FOR MANUFACTURING)
SAME)

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ATTACHMENT

1. (Amended) A semiconductor device comprising:
a substrate;
a first thin film transistor having a first active layer [including] comprising $\text{Si}_{1-x}\text{Ge}_x$
where $0 < X < 1$ formed over said substrate; and
a second thin film transistor having a second active layer [including] comprising silicon
formed over said substrate wherein said second active layer is not intentionally doped with
germanium.

2. (Amended) A semiconductor device comprising:
a substrate;
a first thin film transistor having a first active layer [including] comprising $\text{Si}_{1-x}\text{Ge}_x$
where $0 < X < 1$ formed over said substrate; and

a second thin film transistor having a second active layer [including] comprising silicon formed over said substrate, wherein said second active layer contains no germanium, wherein said first thin film transistor constitutes a CMOS circuit.

3. (Amended) A semiconductor device comprising:

a substrate;

a first thin film transistor having a first active layer [including] comprising $\text{Si}_{1-x}\text{Ge}_x$ where $0 < X < 1$; and

a second thin film transistor having a second active layer [including] comprising silicon, wherein said first thin film transistor constitutes a driver circuit and said second thin film transistor constitutes a pixel matrix circuit.

13. (Amended) A semiconductor device according to claim 1 wherein said semiconductor device is [for use in one of] selected from the group consisting of a handy phone, a video camera, a mobile computer, a head-mount display, a rear-type projector and a front-type projector.

14. (Amended) A semiconductor device according to claim 2 wherein said semiconductor device is [for use in one of] selected from the group consisting of a handy phone, a video camera, a mobile computer, a head-mount display, a rear-type projector and a front-type projector.

15. (Amended) A semiconductor device according to claim 3 wherein said semiconductor device is [for use in one of] selected from the group consisting of a handy phone, a video camera, a mobile computer, a head-mount display, a rear-type projector and a front-type projector.